

REMARKS

In response to the Final Office Action mailed November 26, 2008, Applicants respectfully request reconsideration. Claims 1-14 were previously pending in this application, with claims 1, 8, 10 and 14 being independent claims. By this amendment, claims 1-7 have been amended. The application as presented is believed to be in condition for allowance.

I. Rejections under 35 U.S.C. §102

The Office Action rejects claims 1-7 (including independent claim 1) under U.S.C. §102(b) as allegedly being anticipated by Japanese Patent No. 08-088030 ("Takeuchi"). Claims 8, 9, and 14 (including independent claims 8, and 14) are rejected under U.S.C. §102(b) as allegedly being anticipated by Japanese Patent Publication No. 2000-306605 ("Yonehara"). Applicants respectfully traverse each of these rejections.

A. Rejections Over Takeuchi

Claim 1 as amended recites, "A method of forming an electrolyte comprising an electrolyte composition and a matrix polymer, the method comprising: forming the matrix polymer by polymerization of a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen, **said polymerization being performed after a precursor for the matrix polymer is brought into contact with a surface on which the electrolyte is to be formed** (emphasis added)." By allowing a precursor for the matrix polymer to come into contact with a surface on which the electrolyte is to be formed prior to polymerization, the pores of the surface may be sufficiently filled with the precursor, thereby improving the chemical bonding condition at an electrochemical interface between the solid electrolyte and the surface (Specification, page 24, lines 8-17). Takeuchi fails to disclose or suggest such a matrix polymer that is formed after a precursor for the matrix polymer is brought into contact with a surface on which the electrolyte is to be formed.

The Office Action asserts that, "the lack of a physical description in a product-by-process claim makes determination of the patentability of the claim more difficult..." (Office Action, page 2). Claim 1 has been amended to recite a method. Accordingly, the limitation "said polymerization

being performed after a precursor for the matrix polymer is brought into contact with a surface on which the electrolyte is to be formed,” limits the scope of the claim by reciting a processing step and should be considered.

The Office Action concedes that Takeuchi fails to “explicitly teach that the solid polymer electrolyte is polymerized...after being in contact with a surface on which the electrolyte is formed,” but alleges that “it would be obvious to one of ordinary skill in the art to do so” (Office Action, page 8). Applicants respectfully disagree that the method of claim 1 would be obvious to one of ordinary skill in the art in view of Takeuchi.

In Takeuchi, a solid polymer electrolyte is formed by polymerization of monomer molecules (i.e., ACE, MCE) by heating a viscous liquid of the monomer mixture at 100 degrees C to form a 100-micrometer transparent film on a glass plate (Takeuchi, ¶0051). A wet solar battery is formed by stacking layers of commercial indium, tin oxide, glass transparent electrode, and the solid polymer electrolyte and heating at 100 degrees C for 1 hour (Takeuchi, ¶0042, ¶0053). Thus, the solid polymer electrolyte of Takeuchi is already polymerized (i.e., as a thin film) when it is placed in contact with an electrode.

The Office Action asserts that, “the mere fact that the pores of a surface would be filled if the polymerization occurs after the solution is in contact with the surface is **not patentably distinct** over the applied art and would be an **obvious variation** of the art to one of ordinary skill” (Office Action, page 8, emphasis added). Applicants respectfully disagree. It would not be obvious to one of ordinary skill in the art to bring the viscous monomer mixture of Takeuchi into contact with an electrode prior to polymerization of the solid polymer because the viscous nature of the monomer mixture would not easily fill the pores of the electrode. As described in Applicants’ specification, electrode pores are not easily filled with an electrolyte having a viscous composition resulting in a structure with insufficient conductive properties (Specification, page 4, lines 16). In contrast, the electrolyte formed by the method of claim 1 has fluidity that enables it to sufficiently fill the pores of the electrode to provide a better chemical bonding condition at the electrochemical interface between the solid electrolyte and the electrode surface (Specification, page 24, lines 8-17).

For at least this reason, claim 1 patentably distinguishes over Takeuchi, and it is respectfully requested that the rejection of claim 1 be withdrawn. Claims 2-7 depend from claim 1 and each of

these dependent claims patentably distinguishes over Takeuchi for at least the same reasons as claim 1. Accordingly, it is respectfully requested that the rejection of each of these claims be withdrawn.

B. Rejections Over Yonehara

Claim 8 recites, "A photocell comprising: a semiconductor layer composed of semiconductor particles carrying a dye and an electrolyte layer, the layers being provided between a counter electrode and an electrode formed on a surface of a substrate; wherein the electrolyte layer has a redox couple, an electrolyte composition, and a matrix polymer; and wherein the matrix polymer is a polymer formed by polymerization of a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen." Yonehara fails to disclose or suggest a photocell comprising a semiconductor layer composed of semiconductor particles carrying a dye and an electrolyte layer, the layers being provided between a counter electrode and an electrode formed on a surface of a substrate.

The Office Action asserts that Yonehara discloses a solid polymer electrolyte as well as a semiconductor layer at ¶0108, and further asserts that the electrodes must be present in order for the solar cell to be operable (Office Action, page 9). Applicants respectfully disagree. Yonehara discloses a conductive polymer which contains inorganic semiconductors to which organic coloring matter has been introduced (Yonehara, ¶0108). The conductive polymer of Yonehara can be used as a positive active material or a forward and/or a negative-electrode active material (Yonehara, ¶0105-¶0108). Since the conductive polymer of Yonehara is used as one of the electrodes (positive or negative) in a wet solar battery, it is impossible that the conductive polymer (being one of the electrodes) and the solid polymer electrolyte are provided **between** a counter electrode and an electrode formed on the surface of a substrate, as recited in claim 8.

For at least this reason, claim 8 patentably distinguishes over Yonehara, and it is respectfully requested that the rejection of claim 8 be withdrawn. Claim 9 depends from claim 8, and claim 9 patentably distinguishes over Yonehara for at least the same reasons as claim 8. Accordingly, it is respectfully requested that the rejection of claim 9 be withdrawn.

Claim 14 recites, "A method for manufacturing a photocell comprising: forming a semiconductor layer composed of semiconductor particles carrying a dye between a counter

electrode and an electrode formed on a surface of a substrate; applying a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen; and polymerizing the first compound and the second compound.”

As should be appreciated from the foregoing discussion of claim 8, Yonehara fails to disclose or suggest a semiconductor layer and an electrolyte layer being provided **between** a counter electrode and an electrode formed on the surface of a substrate. Specifically, Yonehara fails to disclose or suggest forming a semiconductor layer composed of semiconductor particles carrying a dye between a counter electrode and an electrode formed on a surface of a substrate. Rather, Yonehara discloses that a conductive polymer may be used as one of the electrodes in a wet solar battery (Yonehara, ¶0105-¶108). For at least this reason, claim 14 patentably distinguishes over Yonehara, and it is respectfully requested that the rejection of claim 14 be withdrawn.

II. Rejections under 35 U.S.C. §103

The Office Action rejects claims 10, 12, and 13 under 35 U.S.C. §103(a) as purportedly being obvious over Takeuchi. The Office Action also rejects claims 10-13 under 35 U.S.C. §103(a) as purportedly being obvious over Yonehara. Applicants respectfully traverse each of these rejections.

Claim 10 recites, “A method for manufacturing a photocell comprising: injecting a mixed solution between a counter electrode and an electrode formed on a surface of a substrate, the mixed solution containing a first compound having at least two isocyanate groups, a second compound having at least two nucleophilic groups containing active hydrogen, and an electrolyte composition having a redox couple; and polymerizing the first compound and the second compound after the mixed solution is brought into contact with the electrode formed on the surface of the substrate.” Yonehara fails to disclose or suggest a method for manufacturing a photocell comprising injecting a mixed solution between a counter electrode and an electrode formed on the surface of a substrate.

For at least the same reasons provided above regarding claims 1, 8, and 14, claim 10 patentably distinguishes over Takeuchi and Yonehara. Accordingly, it is respectfully requested that the rejection of claim 10 be withdrawn. Claims 11-13 depend from claim 10, and each of these dependent claims patentably distinguishes over Takeuchi for at least the same reasons as claim 10.

Accordingly, it is respectfully requested that the rejection of each of these claims be withdrawn.

III. General Comments on Dependent Claims

Since each of the dependent claims depends from an independent claim that is believed to be in condition for allowance, Applicants believe that it is unnecessary at this time to argue the allowability of each of the dependent claims individually. However, Applicants do not necessarily concur with the interpretation of the dependent claims as set forth in the Office Action, nor do Applicants concur that the bases for the rejection of any of the dependent claims is proper. Therefore, Applicants reserve the right to specifically address the patentability of the dependent claims in the future if deemed necessary.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

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Respectfully submitted,

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